Oregon
Kate Brown, Governor

Department of Environmental Quality
Northwest Region
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5263
FAX (503) 229-6945
TTY 711

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Hunter Young
U.S. Environmental Protection Agency
805 SW Broadway, Suite 500
Portland, OR 97205

via electronic delivery (email)

Re: DEQ Comments on the Draft Pre-Design Investigation Work Plan
Arkema Project Area
Portland Harbor Superfund Site

Dear Mr. Young:

The Oregon Department of Environmental Quality (DEQ) reviewed the June 18, 2020 *Arkema Project Area, Pre-Design Investigation Work Plan* (PDI WP) prepared by Integral Consulting Inc. and Dalton Olmsted Fuglevand on behalf of Legacy Site Services LLC. The PDI WP fulfills a portion of the requirements set forth by the U.S. Environmental Protection Agency (EPA) in the Administrative Settlement Agreement and Order on Consent for Remedial Design at River Mile 7W Project Area at the Portland Harbor Superfund Site (PHSS).

DEQ's comments on the PDI WP are presented below for your consideration, divided into General and Specific comments. DEQ welcomes an opportunity to discuss the comments with you as necessary.

General Comments

1. The PDI WP should be stamped by an Oregon-licensed Professional Engineer or Registered Geologist per ORS 672 to the extent geologic or engineering work is produced.

2. The PDI WP precedes the Sufficiency Assessment (SA) for the Project Area, although the PDI WP CSM describes potential transport pathways from upland and in-water sources to the Project Area. DEQ is providing corrections and additional context as it relates to sources and transport pathways; however, review of the SA when it is submitted may identify additional data gaps and comments relevant to the PDI WP.

3. The draft work plan, in a number of instances, characterizes the groundwater barrier wall and groundwater extraction and treatment (GWET) system as effective in preventing the migration of groundwater contaminant around or under the barrier wall to the river. The GWET system is currently the focus of a DEQ-directed adaptive management program to establish hydraulic control of groundwater because the current system has never achieved this objective. DEQ has concluded that sustainable pumping rates from the current extration wells are substantially less then systems design rates, and the existing groundwater extraction

systems is not likely capable of achieving or sustaining the required inward grandients. Migration of contamination around and possibly under the wall is an ongoing concern given the lack of hydraulic control. The work plan should clarify the status of groundwater source control.

4. The riverbank is regulated by the DEQ under an Order on Consent (DEQ No. LQVC-LQVC-NWR-08-04) and the 2017 in-water Portland Harbor ROD. Much of the riverbank is mantled with electrolytic cell debris (e.g., concrete and anodes/cathodes). This debris was not characterized as part of the upland remedial investigation, but is considered possible contaminant source material by DEQ. As determined by the DEQ/Arkema riverbank hot spot dispute resolution, the remedial alternatives for the riverbank must evaluate the removal of the concrete and other cell debris along with the upper three feet of bank fill due to the likely presence of dioxin/furan (and potentially other contaminants) at concentrations above acceptable ecological risk levels and Portland Harbor clean up levels. This condition must be included in the Existing Design Support Information section.

5. As part of the upland remedial investigation, Arkema conducted an ecological risk assessment for terrestrial receptors along the riverbank. This risk assessment concluded that there is unacceptable risk to burrowing mammals from riverbank contaminants. Remedial action is necessary along the riverbank as part of the riverbank remedy to be protective of ecological receptors and to prevent the bioturbation of contaminated bank soil to the riverbank surface.

6. The conceptual contaminant release model presented in the PDI WP does not identify the presence of chlorobenzene DNAPL associated with releases of manufacturing process residue (MPR). The distribution of DNAPL was mapped as part of the upland RI into the riverbank outside of the barrier wall. This work establishes the presence of DNAPL riverward of the groundwater barrier wall on/in the silt unit which separates the shallow and intermediate groundwater zones in the Acid Plant area. This information should be incorporated into the PDI WP.

   Further, during the off-shore investigation, sheen, NAPL blebs and high concentrations of chlorobenzene were observed in the vicinity of the former process discharge pipe that is believed to have discharged MPR during the first year of DDT manufacture. It is reasonable to assume that the MPR discharged via floor drains in the former DDT manufacturing building contained NAPL and discharged to the river through the process discharge pipe. This potential transport pathway should be acknowledged in the PDI WP.

   Relevant sections of the draft work plan, including Figure 1-9 CSM Diagram Dock 1 & 2 Reach, should be updated to include and depict the observed DNAPL riverward of the groundwater barrier wall and potential presence of MPR-related DNAPL at the former process discharge pipe location.

7. The CSM should be expanded to identify upland groundwater plumes which project to the Willamette River, including: the Bayer trespass plume, the DDx plume associated with the fill material on Lots 1 and 2, and the other VOC (chloroform, etc.) and inorganic (chloride, perchlorate, metals etc.) plumes both behind and outside the groundwater barrier. These plumes are identified in the preliminary hot spot evalution and supporting upland documents.

   DEQ also notes construction of the barrier wall would have resulted in detached plumes. The PDI WP should include collection of sufficient transition zone pore-water data from the projected plume discharge areas to determine the need for and design parameters of sediment caps to achieve performance criteria and to monitor and confirm the degradation of plumes that are determined to not require a cap or where suitable cap technology may not be available. Note that plumes discharging outside of sediment management area (SMA) boundaries are subject to DEQ in-water source control measures (e.g., sediment caps or MNR monitoring) where not addressed by the in-water EPA remedy. The PDI WP should take this into account when developing data needs so that any cap design is compatable with the likely additional source control needs to achive Portland Harbor RAOs.

8. The work plan indicates that the three Arkema docks are no longer in use and will be removed as part of the remediation efforts. The Arkema facility is zoned river-dependent use. The document should identify how marine operations are anticipated to be maintained at the site and associated design data requirements.

Specific Comments

1.1 Record of Decision Background and Terminology. Figures 1-3a-b. This figure does not differentiate between RAL and PTW exceedances. Differentiating RAL and PTW exceedances and identifying which COCs exceed would support the sediment sampling location proposal. Consider adding this information to the figure.

1.2.2 Historical Operation Summary. The PDI WP should identify which "grass defoliant" was manufactured at the Site.

1.2.3.2 Groundwater SCMs. See General Comment 3.

1.3.1 Conceptual Site Model. This section includes many unsupported statements regarding potential sources of contamination to the river and not all conclusions are consistent with DEQ's understanding of site conditions. However, most conclusions do not appear to impact the sampling strategy presented in subsequent sections. Referances should be provided to support conclusions to the extent they are necessary for the PDI WP. DEQ has limited it's review of this section to issues that appear to inform the proposed samping.

1.3.1.1 Primary Sources. See General Comment 2.

1.3.1.2 Secondary Sources. See General Comment 2.

1.3.1.2 Secondary Sources. This section only discusses the Arkema chlorobenzene and DDx plume behind the groundwater barrier. There are addional COCs that exceed Portland Harbor CUL levels and JSCS SLVs in the area behind the groundwater barrier and additional Arkema groundwater plumes outside the groundwater barrier as documented in the Preliminary Hot Spot Evaluation and supporting upland doucments. See General Comment 7. A more complete summary of upland groundwater plumes should be included.

1.3.2.1 Upstream Reach. This section inaccurately states that groundwater plumes discharging to the upstream reach have been curtailed by installation of the groundwater barrier wall. The statement should be corrected. See also General Comment 3.

Additionally, this section states that Arkema treated hexavalent chromium and perchlorate in groundwater in the upstream reach. It is correct that Arkema implemented a groundwater treatment program for hexavalent chromium. However, the effectiveness monitoring program and evaluation for the need for additional in-situ treatment was not implemented with the decision to construct the groundwater barrier wall and GWET system. Therefore, the effectiveness of the program is unknown. A more complete summary of the upland groundwater plumes should be included.

Further, Arkema did not treat perchlorate in groundwater as stated in this section. Arkema did develop a draft field pilot plan to bioremediate perchlorate in-situ in upland groundwater, however the groundwater barrier wall/GWET source control measure was pursued instead. The PDI WP should be updated to reflect this information.

1.3.2.1 Upstream Reach. See General Comment 4 regarding the riverbank and note that the reference to Figures 1-8a-c should reference Figures 1-10a-c.

1.3.2.2 Dock 1 and 2 Reach. See General Comments 3, 4, 5, 6 and 7. The reference to Figures 1-8a-c should reference Figures 1-10a-c.

1.3.2.3 Outfall 004 Reach. See General Comments 4, 5 and7.

1.3.2.4 Downstream Reach. See General Comments 4, 5 and 7.

2.1 BACKGROUND. See General Comments 4, 5 and 6.

2.2 Use of RALs and PTW for Screening and Remedial Decision-Making. It apprears Arkema does not intented to apply the PTW threshold for HxCDF. This is not considant with DEQ's understanding of the ROD requirments. The work plan should be revised to include the PTW threshold for HxDCF for remedial decision making.

2.3.5 Total PCBs. The work plan states there is an absence of known upland PCB sources from the Arkema operation. This is not consistant with the upland investigations. For example, numerous PCB-containing transformers were present on site both associated with the Arkema facility and the supporting Bonneville Power substations and PCB-contaminated boiler fuel as documented in an EPA TSCS enforcement action.

2.3.7 Chlorobenzene. The wording of this section is misleading and is not consistant with upland investigation conclusions. NAPL has been observed in riverbank soil. See General Comment 6.

2.5 NAPL. See General Comment 7.

2.6 Groundwater. It is unclear why this section only addresses groundwater between the acid plant area and top bank. See General Comment 7.

2.10.1 Surface Sediment and Riverbank Soil. This section states there are no data gaps for surface sediment, however it is not clear what criteria were used to support this determination. The work plan should state if the current data set is consistant with the EPA design guidelines for all focused COCs in surface sediment and provide supporting figures so the validity of these conclusions can be assessed.

2.10.1 Surface Sediment and Riverbank Soil. As noted above in General Comments 5 and 6, river bank soil was not fully evaluated as part of the upland investigations. It is unclear if the proposed sampling is sufficant to fully address data needs for the river bank. Additional river bank sampling may be needed depending on the findings of the first phase of sampling and the proposed river bank design.

Section 2.10.1 Surface Sediment and Riverbank Soil. Riverbank soil data should be compared with cleanup levels, as well as RALs, to evaluate the potential for soil transport to the river to impede or delay natural recovery in the Project Area. Further, the reference in the second paragraph to Section 2.11.2 is likely intended to refer to Section 2.10.2.

Sections 2.10.1.2 through 2.10.1.5 Surface Sediment and Riverbank Soil for 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 2,3,7,8-TCDD and total PCBs. No riverbank data are available for the referenced analytes between Dock 1 and Dock 2, and are limited in other locations. Additional riverbank areas beyond those identified should be sampled and analyzed for these analytes.

Section 2.10.2.7. See General Comment 6.

Section 2.10.2.7 NAPL and Chlorobenzene PTW. The final paragraph in the section indicates that sheens, blebs, and globules observed in select boreholes is not related to past industrial practices at the Arkema site. Additional information should be provided to support this conclusion.

Section 2.10.3 Groundwater Discharge and Porewater. The text indicates that the post-remediation CSM for the Arkema Project Area is shown on Figure 1-7. Please clarify what is intended by “post-remediation”. Also, the reference to Figure 1-7 may be a typo; is Figure 1-9 intended?

Section 2.10.3 Groundwater Discharge and Porewater. The section indicates that one key groundwater data gap is the COC concentrations in the upland shoreward of the barrier wall. The

PDI WP should identify the upland groundwater COCs throughout this section. See General Comment 7.

Section 3.1.1.1 Problem Statements. The section indicates that existing DDx and PeCDF/TCDD data for surface sediment are insufficient to define the remedial extent, yet previously in the document (for example Section 2.10.1) the text indicates that there are sufficient surface sediment data, pending results of the subsurface investigation. Please clarify.

Section 3.1.1.1 Problem Statements. The section indicates that data for focused COCs and additional contaminants are insufficient to prepare a remedial design. Please clarify which additional contaminants are being referenced.

Section 3.1.1.3 Study Design. The section indicates that based on the results of subsurface sample data, surface sampling may be conducted to support remedial decision-making. The text should describe how the subsurface data will be interpreted to determine the need to conduct surface sampling.

Section 3.2 Riverbank Soil. This section describes riverbank soil sampling at select locations as shown on Figure 3-1. In general, DEQ notes that the number and density of sample locations may be insufficient, and that a second phase of riverbank sampling may be necessary and should be acknowledged and planned for in the PDI WP. Further, the rationale for sample placement should be provided. For example, there is a cluster of sample locations between Outfall 004 and WR-6; the rationale for placement of the samples at this location should be provided. In addition, the rationale for the sample depth of four feet should be provided. Finally, no samples are proposed south and west of the Salt Dock, offshore of Bird Inc./GS Roofing. This portion of the riverbank should be characterized unless additional information is provided to support a determination that no characterization is necessary.

Section 3.4 Sediment Stability. The section indicates that sediment cores will be advanced to assess historical deposition rates downstream of Dock 2 during Phase 2 if necessary based on the results of the Phase 1 investigation. The text should describe circumstances under which Phase 1 results would trigger this Phase 2 investigation.

Section 3.4 Sediment Stability. The text indicates that the sediment stability assessment will be used to assess historical deposition rates downstream of Dock 2. The text should explain the importance of historical deposition rates for the design, in particular because the text previously states that the docks will be removed as part of remedial construction, altering river dynamics and future deposition rates.

3.6.1 Residual COCs in Groundwater. The proposed upland sample locations and analytes (DDX and VOCs) are insufficient. All upland groundwater plume contaminants detected in top of bank monitoring wells need to be included in this program, including chloride and chloroform. See General Comment 7.

3.6.3 COC Flux to the River. The proposed analytes and flux chamber locations are insufficient to characterize the full range of contaminant flux from upland groundwater plumes projecting into the river. The analytes should be expanded to include all upland groundwater contaminants

in top of bank monitoring wells and the locations should be expanded to include all offshore groundwater plume areas. See General Comment 7.

3.7.3.2 Site Visit and Observation. The text indicates that a site visit will be conducted to observe and record site conditions over multiple datys to visually assess hydrodynamic conditions in the Project Area. The text should indicate if there are specific water level conditions that will be targeted, and if so, why.

Thank you for the opportunity to comment. Please feel free to contact me at 503-229-6932.

Sincerely,

Madi Novak

Madi Novak, Project Manager/Toxicologist
DEQ NWR Cleanup Program

cc: Lance Peterson, CDM
Dave Lacey, DEQ
Katie Daugherty, DEQ